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NEW SPECIES OF SAGARITIS WITH A KEY TO THE GENUS (ICHNEUMONIDAE HYMEN.)*

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The present paper is intended as a supplement to our knowledge of the Canadian species of *Sagaritis*, a genus which has been monographed by Mr. H. L. Viereck in his "Preliminary Revision of the Campopleginae in the Canadian National Collection," published serially in the Canadian Entomologist, Vols. LVII, LVIII.

In checking up the species it has been found necessary to make several minor corrections in Viereck's key owing to the misplacement of one or two species and since the interpolation of new couplets in the previous key appears to be too cumbersome it has been thought best to present here a complete key to the genus embracing Viereck's additions as well as the species described herein. The key is based entirely on a study of the type specimens in the Canadian National Collection.

KEY TO THE SPECIES OF SAGARITIS IN THE CANADIAN NATIONAL COLLECTION.

1. Recurrent vein received in or beyond middle of areolet 2.
2. Recurrent vein received before middle of areolet 20.
2. Hind coxae pale at least beneath 14.
3. Hind coxae black 3.
3. Front coxae not black 4.
4. Front coxae black 10.
4. Femora not swollen 8.
5. Femora swollen 5.
5. Second tergite without a reddish apical band *lipopus* Vier.
6. Second tergite with a reddish apical band 6.
6. Third and following tergites partly reddish *lipomerus* Vier.
7. Third and following tergites black 7.
7. Hind tibia with an incomplete whitish annulus, second tergite with reddish band indistinct *bigelowi* Vier.
8. Hind tibia without an incomplete whitish annulus *cingulatus* Vier.
8. Abdomen partly pale reddish 9.
9. Abdomen entirely dark *medius* Vier.
9. Hind tibiae without an incomplete whitish annulus at most a yellow stripe, ♂ *lipomerus* Vier.
10. Hind tibiae with an incomplete whitish annulus *rufosignatus* Vier.
10. Abdomen above more or less reddish 13.
11. Abdomen above entirely black 11.
11. Mid proximal trochanters reddish or blackish 12.

*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Mid proximal trochanters yellowish *congregator* Walley.

12. Areolet petiolate in ♀; front and mid coxae black above and below *unicolor* Vier.
..... Areolet sessile in ♀; front and mid coxae brownish below *atypicus* Vier.

13. Abdomen beyond the second tergite almost entirely reddish .. *diversus* Vier.
..... Abdomen beyond the second tergite mostly black *intermedius* Vier.

14. Areolet sessile, abdomen mostly reddish, mandibles yellow .. *compactus* Prov.
..... Areolet petiolate 15.

15. Abdomen partly reddish 16.
..... Abdomen virtually all black, ovipositor exserted over one third the length
of the abdomen; hind tibiae whitish at base *taeniatus* Vier.

16. Apex of post petiole yellowish or reddish 17.
..... Apex of post petiole black *conunctus* Cress.

17. Hind tibiae without an incomplete whitish or yellowish annulus or stripe
..... *downsi* Vier.
..... Hind tibiae with an incomplete whitish or yellowish annulus or stripe .. 18.

18. Hind tibiae with an incomplete whitish annulus *apicalis* Vier.
..... Hind tibiae with an incomplete yellowish annulus 19.

19. Mandibles yellowish except tips, palpi whitish *latus* Vier.
..... Mandibles and palpi stramineous *xanthotacnius* Vier.

20. Greatest diameter of lateral ocelli as long as or longer than the ocellocu-
lar line 21.
..... Greatest diameter of lateral ocelli shorter than the ocellocular line 68.

21. Hind coxae reddish or brownish at least in part 22.
..... Hind coxae black above and below 30.

22. Hind coxae reddish throughout 23.
..... Hind coxae reddish or brownish in part 24.

23. Fourth tergite in ♂ black at base 29.
..... Fourth tergite in ♂ wholly red 28.

24. Areola longer than wide *conunctiformis* Vier.
..... Areola not longer than wide 25.

25. Scape stramineous .., 59.
..... Scape black 26.

26. Abdomen not almost entirely black above 27.
..... Abdomen almost entirely black above *patsuiketorum* Vier.

27. Hind tibiae partly whitish *atkinsoni* Vier.
..... Hind tibiae not partly whitish *interruptus* Vier.

28. Areolet incomplete *incompletus* Vier.
..... Areolet complete *nephelodis* Ashm.

29. Hind tibiae not partly whitish *nigrisignatus* Vier.
..... Hind tibiae partly whitish *beaulieu* Vier.

30. Hind tibiae with an incomplete whitish annulus 51.
..... Hind tibiae without an incomplete whitish annulus, at most a yellowish
stripe 31.

31. First and following tergites not pale at apex 32.
..... First and following tergites mostly pale at apex 33.

32. Mandibles yellow to the base *nigricoxus* Vier.
 Mandibles stramineous, blackened at base *melanosomus* Vier.

33. Front and mid coxae blackish 34.
 Front and mid coxae pale 40.

34. Hind legs entirely black *gorhami* Vier.
 Hind femora black only at base 35.

35. Sides of tergites 4, 5 and 6 mostly blackish 36.
 Sides of tergites 4, 5 and 6 mostly reddish 37.

36. ♀ with front proximal trochanters mostly black except tips, hind femora blackish at base and with a black stripe *strigosus* Vier.
 ♀ with front proximal trochanters mostly stramineous, hind femora with only a trace of blackish at base and without a black stripe *nigricoxus* Vier.

37. All tergites except the first almost or entirely reddish 38.
 All tergites except the first not entirely reddish but with black 39.

38. Mid proximal trochanters black, areolet with outer vein hyaline *linearis* Vier.
 Mid proximal trochanters reddish stramineous, areolet with all veins brownish *parasignatus* n. sp.

39. Third and fourth tergites almost wholly reddish, hind tibiae blackish on basal and apical third *signatus* Vier.
 Third and fourth tergites mostly black above, hind tibiae not noticeably blackish at base and apex *californicus* Holmg. race.

40. Scape reddish *rufiscapus* Vier.
 Scape black 41.

41. Hind femora reddish at base 42.
 Hind femora blackish or black at base 44.

42. Area dentiparia finely sculptured 48.
 Area dentiparia coarsely sculptured 43.

43. Third and fourth tergites blackish throughout *hoppingi* Vier.
 Third and fourth tergites with the apical margins reddish *trackas* Vier.

44. Hind femora with a black stripe *strigosus* Vier.
 Hind femora without a black stripe 45.

45. Areola dullish, shagreened or rugulose 46.
 Areola polished *evansi* Vier.

46. Hind tibiae without a yellowish stripe 47.
 Hind tibiae with a yellowish stripe *trochanteralis* Vier.

47. Sides of the second and third tergites mostly reddish *imperfectus* Vier.
 Sides of the second and third tergites mostly black *englishi* Vier.

48. Areola truncate at base 49.
 Areola nearly pointed or acute angled at base *perdistinctus* Vier.

49. Nervellus not angulated 50.
 Nervellus angulated *nocturnus* Vier.

50. All tergites with a pale apical margin *twinni* Vier.
 Apical third of second tergite reddish, third and fourth tergites almost entirely reddish, the following tergites black *clitellarius* n. sp.

51. Front and mid coxae mostly black 52.
 Front and mid coxae mostly pale, stramineous or reddish stramineous 61.

52. Areola incomplete, nearly as in *australis*, hind tibia with a yellowish or

whitish stripe	53.
Areola complete	54.
53. Hind femur with base black, the black extending to form a black stripe the length of the femur	<i>vierecki</i> n. sp. 71.
Hind femur with base black but without a black stripe <i>septentrionalis</i> Vier. 71.	
54. Abdomen above sometimes almost but never entirely black	55.
Abdomen above entirely black	58.
55. Second and following tergites partly reddish	56.
Second and following tergites black	57.
56. Hind femora not blackish at base	<i>kingi</i> Vier. 71.
Hind femora blackish at base	<i>websteri</i> Vier. 71.
57. Hind femora black at base	<i>tibialis</i> Vier. 71.
Hind femora reddish at base	<i>chrystali</i> Vier. 71.
58. Hind femora mostly black	<i>melanomerus</i> Vier. 81.
Hind femora mostly reddish	<i>aequalis</i> Vier. 81.
59. Fourth and following tergites reddish, hind coxae brownish	<i>apicatus</i> Vier. 81.
Fourth and following tergites partly black	60.
60. Fourth tergite not reddish to base	<i>hexagonalis</i> Vier. 81.
Fourth tergite reddish to base	<i>imperfectus</i> Vier. 81.
61. Hind femora without a black stripe	63.
Hind femora with a black stripe, abdomen banded	62.
62. Bands of abdomen conspicuous	<i>conspicuosus</i> Vier. 81.
Bands of abdomen inconspicuous	<i>inconspicuosus</i> Vier. 81.
63. Sides of the third, fourth and fifth tergites virtually entirely black	64.
Sides of the third, fourth and fifth tergites largely reddish	65.
64. Hind femora blackened at base, plica mostly yellowish	<i>approximalis</i> n. sp. 81.
Hind femora not blackened at base, plica most brownish	<i>citrinus</i> Vier. 81.
65. Hind femora black at base	<i>julius</i> Vier. 81.
Hind femora not black at base	66.
66. Third and fourth tergites mostly black	<i>aprilis</i> Vier. 81.
Third and fourth tergites virtually entirely reddish	67.
67. Areola complete	<i>maius</i> Vier. 81.
Areola incomplete	<i>teulonensis</i> Vier. 81.
68. Abdomen partly rufous or yellowish above	71.
Abdomen black throughout above	69.
69. Areola not longer than wide	70.
Areola longer than wide	<i>striatipes</i> Ashm. 81.
70. Front and mid coxae black	<i>lacvis</i> Vier. 81.
Front and mid coxae pale	<i>melanocerus</i> Vier. 81.
71. Hind coxae reddish	72.
Hind coxae black	80.
72. Second, third and fourth abdominal segments mostly bright reddish	73.
Second, third and fourth abdominal segments blackish red <i>occidentalis</i> Ashm. 81.	
73. Fourth tergite not entirely reddish	76.
Fourth tergite entirely reddish	74.
74. Scape piceous, areolet large trapezoidal	75.
Scape stramineous	<i>stramineiscapus</i> Vier. 81.

75. Hind proximal trochanters mostly blackish *oxylus* Cress.
 Hind proximal trochanters reddish almost concolorous with hind coxae
 *lawrencei* Vier.

76. Fourth tergite reddish, blackish at base 77.
 Fourth tergite reddish, blackish at apex *ruficoxalis* Vier.

77. Scape black 78.
 Scape at least partly pale 79.

78. Front and mid trochanters yellow *nigriscapus* Vier.
 Front and mid trochanters reddish as in coxae
 *nigriscapus* var. *rufitrochanteralis* n. var.

79. Areola nearly pointed at base *garretti* Vier.
 Areola nearly equilateral *basalis* Vier.

80. Abdominal segments without an apical yellowish band 82.
 Abdominal segments with an apical yellowish band 81.

81. Front and mid coxae black *taylori* Vier.
 Front and mid coxae pale *flavicincta* Ashm.

82. Spiracles of first segment nearer to each other than to apex 83.
 Spiracles of first segment as near or nearer to the apex than to each other
 *yakutatensis* Ashm.

83. Fifth segment mostly blackish laterally; propodeum coarsely sculptured 85.
 Fifth segment mostly reddish laterally; propodeum finely sculptured 84.

84. Mid coxae black above *prodeniae* Vier.
 Mid coxae pale above *modestus* Vier.

85. Front and mid proximal trochanters yellowish 86.
 Front and mid proximal trochanters black *consimilis* Ashm.

86. Front and mid coxae yellowish *ruficrus* Vier.
 Front and mid coxae blackish *ruficrus* var. *pacificus* n. var.

***Sagaritis approximalis* n. sp.**

Compare with *Sagaritis citrinus* Vier. (Can. Ent., LVIII, 123).

Mac. Length 6 mm.; black, antennae black throughout, mandibles yellow, palpi and tegulae yellowish white the latter with transparent margins; front and mid coxae reddish stramineous at base and yellowish below; hind coxae and hind proximal trochanters black, entire front and mid trochanters and hind distal trochanters yellowish; front and mid femora stramineous, hind femora reddish blackened at base; front and mid tibiae stramineous their extensor surfaces whitish except at apex of mid tibiae, hind tibiae blackened on basal one-fourth and apical one-third with the space between whitish except for a brownish stripe on the flexor surface; front and mid tarsi stramineous, hind tarsi blackish with their basi-tarsi whitish on basal fifth. Abdomen black, first tergite with a stramineous margin, second tergite reddish brown on apical one-eighth, third and following tergites only obscurely reddish at apex; plica mostly yellowish. Areola pentagonal, rugulose; petiolarea coarsely sculptured. Wings with areolet petiolate the petiole at least as long as the shortest side of the areolet.

Holotype—♂, Oliver, B. C., April 19, 1923 (C. B. Garrett) No. 2506 in the Canadian National Collection, Ottawa.

Paratypes—2 ♂, same data as the holotype.

Resembles *Sagaritis citrinus* Vier., but with hind femora blackened and plica yellowish.

Sagaritis clitellarius n. sp.

Male. Length 5 mm.; black, antennae black throughout, mandibles yellow except tips, palpi and tegulae yellow, front and mid coxae stramineous, hind coxae uniformly black. Entire front and mid proximal and apical trochanters and apical hind trochanters yellow, hind proximal trochanters black with stramineous apical margin; front and mid femora pale reddish stramineous; hind femora brownish stramineous; front and mid tibiae yellowish on the extensor surface and yellowish stramineous on the flexor surface and apex, hind tibia stramineous with basal one fourth and extensor apical one-third blackened, the middle third of flexor surface of hind tibiae obscurely yellowish; front tarsi yellowish stramineous becoming stramineous apically, mid tibiae missing, hind tibiae blackish with the first joint narrowly yellowish at base. Abdomen black, first tergite with a very narrow reddish border, second tergite reddish on apical one-third, third tergite entirely reddish except in middle at base, fourth tergite reddish except at apex laterally; plica mostly yellowish. Areola defined, rugulose; petiolarea costate with the lateral carinae ill-defined.

Holotype—♂, Oliver, B. C., April 19, 1923, (C. B. Garrett) No. 2507 in the Canadian National Collection, Ottawa.

Easily separable from *Sagaritis twinni* Vier. by the abdominal markings.

Sagaritis nigriscapus var. **rufitrochanteralis** n. var.

Compare with *Sagaritis nigriscapus* Vier. (Can. Ent., LVIII, 128).

Female. Length 5.5 mm.; antennae black throughout, mandibles yellowish, palpi and tegulae pale stramineous. All coxae, trochanters and femora reddish except the hind proximal trochanters which are black with reddish apices and the hind coxae which are brownish at base behind; front and mid tibiae reddish stramineous, hind tibiae stramineous with basal and apical one-fourth blackened; front and mid tarsi stramineous, hind tarsi blackish except for yellowish base of hind basi-tarsi. Abdomen reddish with black as follows: first tergite black except extreme apex, second tergite on basal two-fifths, third tergite on basal one-fourth, fourth tergite on basal one-third above but not laterally, fifth tergite black except laterally, remaining tergites wholly black. Areola shagreened, petiolarea transversely rugose.

Holotype—♀, Oliver, B. C., April 28, 1923, (C. B. Garrett), No. 2508 in the Canadian National Collection, Ottawa.

This variety as the name implies differs from *Sagaritis nigriscapus* Vier. in the reddish front and mid trochanters and the yellow mandibles.

Sagaritis nigriscapus Vier. has yellow front and mid trochanters and stramineous mandibles.

Sagaritis parasignatus n. sp.

Female. Length 7 mm.; black antennae black throughout, mandibles mostly yellowish, palpi stramineous, tegulae pale yellow with transparent margins; front and mid coxae black above and reddish brown beneath, hind coxae wholly black; front and mid apical trochanters stramineous; front and mid proximal trochanters, femora and tibiae reddish stramineous; hind proximal trochanters black-

ish obscurely reddish at tips; hind apical trochanters, femora and tibiae reddish brown, the hind tibiae narrowly blackened at bases and extreme apices on extensor surface. All tarsi reddish brown obscured with blackish and becoming darker apically, the ultimate segment being wholly blackish, the first segment only obscurely stramineous at its base. Abdomen with first tergite black except for a narrow reddish margin, second tergite blackened only in dorsal region on the basal one-fourth, remainder of tergites reddish brown as in hind femora. Pro-podeal carinae weak, the areola and lateral areas finely rugose, the petiolarea rugulose.

Holotype—♀, Indian Head, Sask., June 3, 1925 (J. J. de Gryse), No. 2509 in the Canadian National Collection, Ottawa.

This species resembles *Sagaritis signatus* Vier. and *Sagaritis linearis* Vier., from the former it is distinguished by the characters given in the key and by having all the tergites beyond the second, reddish, whereas in *Sagaritis signatus* Vier. the three apical tergites are blackened. *Sagaritis parasignatus* also has the front and mid coxae black above and reddish beneath; in *Sagaritis signatus* Vier. all the coxae are black. *Sagaritis parasignatus* is distinct from *Sagaritis linearis* Vier. by the nature of the areolet, the reddish mid proximal trochanters and the rugulose petiolarea of the former.

***Sagaritis vierecki* n. sp.**

Fig. 1.

Compare with *Sagaritis septentrionalis* Vier. (Can. Ent., LVIII, 76).

Female. Length, 7 mm.; black, resembles *Sagaritis septentrionalis* Vier. very closely but may be distinguished by the black stripe borne on the hind femora and the more pronounced basal and apical bands on the hind tibiae.

Differs from *Sagaritis septentrionalis* Vier. as follows: Hind femora blackened at base and with the blackish extending along the dorsal surface to form a blackish stripe; mid tibiae brownish rather than stramineous sub-basally, on apical third and along flexor surface with a whitish stripe on extensor surface; hind tibiae with well defined blackish bands on basal one-fourth and apical one-third with a whitish annulus between, flexor surface reddish. Abdomen black the first tergite obscurely pale at apex, second tergite brownish stramineous at extreme apex. In one paratype the first two tergites are wholly black.

Holotype—♀, Oliver, B. C., April 11, 1923 (C. B. Garrett) No. 2510 in the Canadian National Collection, Ottawa.

Paratypes—2 ♀, same data as holotype.

It gives me pleasure to name this species in honor of Mr. H. L. Viereck to whom we owe the major portion of our knowledge of the Campopleginae of Canada.

***Sagaritis ruficrus* var. *pacificus* n. var.**

Fig. 2.

Compare with *Sagaritis ruficrus* Vier. (Can. Ent., LVIII, 127).

Male. Length 6 mm.; head including antennae, black; mandibles, palpi and tegulae yellow, the latter with transparent margins; front coxae black with narrow yellowish apices, mid coxae black becoming brownish towards apex below, hind coxae wholly black; front and mid trochanters yellow, hind proximal

trochanters black, hind distal trochanters yellow; femora reddish stramineous the hind pair with a trace of fuscous at base; front and mid tibiae and tarsi reddish stramineous, hind tibiae yellowish stramineous on extensor surface with base and apex rather brownish; hind metatarsi yellowish at base, remainder of hind tarsi brownish. Abdomen black, second and third tergites with the apical margin dark stramineous, fourth tergite stramineous laterally and obscurely so on apical margin. Areola weakly defined and shagreened, not costate as in *Sagaritis ruficrus* Vier., petiolarea irregularly costulate.

Holotype—♂, Victoria, B. C. (N. Downes) No. 2511 in the Canadian National Collection, Ottawa.

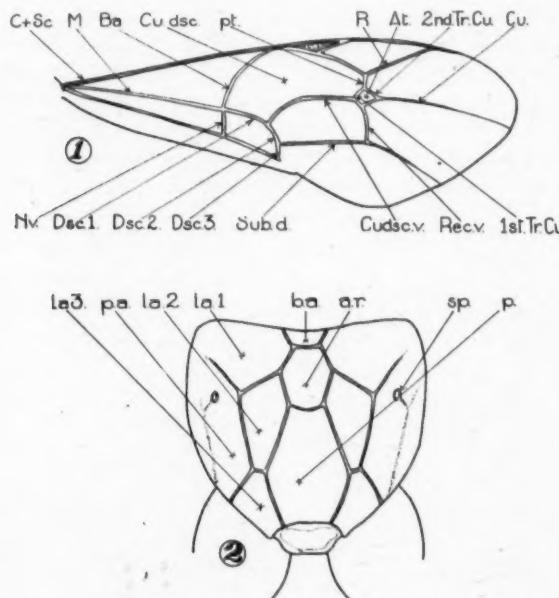


Fig. 1.—Fore wing of *Sagaritis vierecki* n. sp. C + Sc., Costa + Subcosta; M, Media; R, Radius or marginal vein; Cu, Cubitus; Ba, basal vein; Dsc. 1., discoidal vein or 1st abscissa; Dsc. 2., discoidal vein or 2nd abscissa; Dsc. 3., discoidal vein or 3rd abscissa; Sub. d., Subdiscoidal vein; Nv., Nervulus; Rec. v., recurrent vein; 1st Tr. Cu., 1st transverse cubital vein; 2nd Tr. Cu., 2nd transverse cubital vein; Cu. dsc. v., cubitodiscoidal vein; pt., petiole of areolet; At., areolet; Cu. dsc., cubitodiscoidal cell.

Fig. 2.—Propodeum of *Sagaritis ruficrus* var. *pacificus* n. var. b. a.; basal area; ar., areola; p., petiolarea; sp., spiracle; L. a. 1., 1st lateral area; L. a. 2., 2nd lateral area; L. a. 3., 3rd lateral area; p. a., pleural area.

In general this variety closely resembles *Sagaritis ruficrus* Vier. which is known only by the single male type specimen taken at Waterton, Alta. In the typical *ruficrus* Vier. the front and mid coxae are largely yellowish and the costate areola is confluent with the petiolarea. In variety *pacificus* the front and mid coxae are largely black and there is a definite areola which is shagreened and not costate.

A FEW CAPITOPHORUS SPECIES OF UTAH WITH DESCRIPTIONS
OF TWO NEW SPECIES (APHIDIDAE).BY GEORGE F. KNOWLTON,
Utah Agricultural Experiment Station, Logan.**Capitophorus oestlundii** n. sp. (1).

This interesting aphid (2) is found quite commonly throughout Utah on rabbit brush (*Chrysothamnus nauseosus*). It was exceptionally abundant along the foothills of the Wellsville Mountains north of Brigham City during the fall of 1926. The oviparous and most of the viviparous forms observed are wingless, while the males are winged.

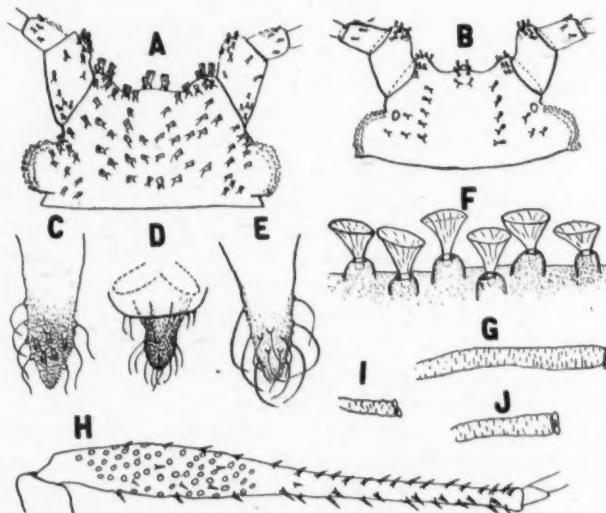


Fig. 1. *Capitophorus oestlundii* n. sp. A, head of apterous viviparous; B, head of alate male; C, cauda of apterous viviparous; D, posterior end of male; E, cauda of apterous oviparous; F, section of body margin of apterous viviparous, highly magnified, to show shape of hairs; G, cornicle of apterous viviparous; H, hind tibia of apterous oviparous showing sensoria; I, cornicle of alate male; J, cornicle of apterous oviparous.

The colonies of this aphid are usually found on the younger leaves toward the tips of the branches. Here the larger forms are usually lined up, end to end, in the V-shaped depression on the upper side of the leaves with heads pointed toward the petiole. The smaller forms crowd in around the larger, arranged in all positions. When the infestation is heavy, the flowerheads and their tender supporting stocks are attacked; later all of the leaves may be quite highly infested on both sides.

The apterous viviparous and the oviparous forms usually lie quietly with legs drawn up and antennae lying along the back, giving the appearance of two dark lines down the body. When moving around, the antennae are waved about although not so actively as in the case of the more nervous males. It takes con-

(1)—Professor O. W. Oestlund, University of Minnesota, Minneapolis, Minnesota.

(2)—The writer wishes to thank Dr. C. P. Gillette, Miss M. A. Palmer, and Mr. P. W. Mason for their opinions regarding this form.

siderable disturbance to excite the apterous females, but, when noticeably disturbed, they often drop from the plant to the ground. Very little disturbance, however, will usually cause the males and winged viviparous forms to take flight.

The feeding of even large numbers of this aphid, seems to do little damage to the plant. However, it is, at times, numerous on plants distorted by other aphids (usually belonging to the genus *Aphis*), but probably would not be mistaken as the one causing the distortion.

The summer forms are bluish-green to apple-green, with a white pruine covering over the body. Toward fall, a slight reddish cast is acquired, and later all of the forms acquire the reddish to reddish-brown coloration. This red coloration in the fall is also common to a number of other aphids attacking rabbit brush.

The females are dorso-ventrally compressed to some extent, although less so in the oviparous forms where the abdomen is more arched because of the large eggs it contains. The males are rather small, narrow, and do not resemble the elongate females in general form.

Alate females were taken at Fruita on June 27, 1926, among the much more numerous aptera. While pupae were numerous at Brigham City on September 25, no mature males were found until October 8, but on this date they were numerous. Mature oviparous forms were taken two days earlier. The last collection was made on October 30, and great numbers of males, nymphs, oviparous, and viviparous females were present.

Alate Viviparous Female.—Color, bluish-green; size 1.8 mm. long; head and body armed with many prominent capitate to fan-like hairs; rostrum reaching second coxae; head having rather prominent antennal tubercles, slightly gibbous on inner surface, eyes having ocular tubercles poorly developed; antennae blackish with most of III, distal ends of IV, V, and all of VI black; first antennal gibbous on inner surface; III, 0.57 to 0.59 mm. long and armed with 10 to 14 oval sensoria; IV, 0.6 to 0.62 mm., with 0 to 1 sensoria; V, 0.55 mm.; VI, 1.04 (1.3+0.91) mm.; legs moderate in length; wing venation typical, veins brownish; lateral tubercles lacking; cornicles cylindrical, 0.35 mm. long and slightly swollen before moderate flange; cauda elongate, very slightly constricted near base, having three curved hairs on each side, and four on dorsal surface.

Apterous Viviparous Female.—Summer forms bluish-green to apple-green and becoming reddish to brownish-red in the fall; body with a whitish pruine covering; size 2.5 to 3 mm. long; rostrum reaching second coxae; head and body armed with numerous capitate to fan-like hairs; eyes projecting prominently from head with ocular tubercles lacking, or if present, rudimentary; antennal tubercles moderately prominent; antennae held over back when at rest, lying as two dark, parallel lines down the body; first antennal gibbous on inner surface; antennal III, 0.58 to 0.6 mm. long and with 1 to 3 oval sensoria near the base; IV, 0.43 mm.; V, 0.41 to 0.45 mm.; VI, 0.83 to 0.88 (0.1+0.73 to 0.11+0.77) mm.; antennae greenish with distal ends of III, IV, V, and all of VI black; legs moderate in length and when at rest folded under body so that the aphid lies prone on the plant; lateral tubercles lacking; cornicles 0.38 to 0.4 mm. long, slightly curved with some swelling toward distal end and with a

slight constriction before the flange; cauda elongate with three or four long curved hairs in a row on each side and five fan-like (sometimes one or more are finger-like) hairs on distal end of dorsum.

Apterous Oviparous Female.—Varies from viviparous form in always being reddish to brownish-red; averaging 2 to 2.5 mm. long; abdomen shorter and more rounded; antennae vary considerably, III, 0.5 to 0.73 mm. with one to three sensoria near base; IV, 0.35 to 0.45 mm.; V, 0.36 to 0.43 mm.; VI, 0.77 to 0.84 (0.11+0.6 to 0.73) mm.; hind tibia swollen and most of basal half covered with oval sensoria; cornicles 0.2 to 0.24 mm. long; cauda rather cylindrical, and hairs on dorsal surface long and tapering, to finger-like.

Alate Male.—Reddish-brown to blackish-brown with pruinose covering; beak not reaching second coxae; antennal tubercles rather prominent; hairs on head capitate to fan-like; first antennal gibbous on inner surface; antennae black, slender, armed with short, finger-like hairs; antennal III, 0.51 to 0.57 mm. long and armed with 27 to 35 oval sensoria with rather wide margins; IV, 0.41 to 0.45 mm. with 23 to 30 sensoria; V, 0.38 to 0.42 mm. with 20 to 27 sensoria; VI, 0.78 to 0.84 (0.13+0.65 to 0.14+0.7) mm.; legs long, slender; wings long and rather narrow with typical venation, veins brownish-black; cornicles 0.11 mm. long, enlarging toward tip with slight constriction before flange; cauda elongate, sometimes slightly constricted near base.

Eggs.—Length 0.67 mm.; greenish-yellow when deposited on leaf or on scales below flower, but changing to shiny black. The eggs are well-developed in body of oviparous female soon after maturity, although they are often not deposited for several days.

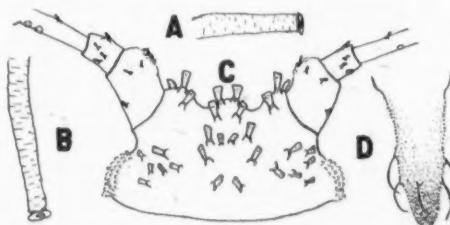


Fig. 2. *Capitophorus wasatchii*, n. sp. A, cornicle of pupa; B, cornicle of apterous viviparous; C, head of apterous viviparous; D, cauda of apterous viviparous.

Few eggs were found at Brigham City until about two weeks after oviparous forms were numerous. In the early spring of 1927, very few eggs could be found, though leaves and old flowers were still present on the bushes, to a large extent.

This aphid has been collected from Amalga, Beaver Dam, Blacksmith Fork Canyon, Brigham City, Clarkston, Clear Creek Canyon, Draper, Fruita, Honeyville, Hyrum, Lehi, Lewiston, Loa, Logan, Madsen, Providence, Torry, Tremonton, Trenton, and Smithfield, in Utah. It was also collected at Preston, Idaho.

The cotypes are in the U.S. National Museum, the Utah Agricultural Experiment Station collection, University of Minnesota collection and in the collection of the writer.

Capitophorus wasatchii n. sp.

Collected at Amalga, Utah on September 1, and on the foothills of the Wasatch Mountains at Honeyville and Madsen eleven days later, during the fall of 1925.

This greenish aphid feeds in colonies on the leaves of rabbit brush (*Chrysothamnus nauseosus* var. *graviolens*) much as in the case of *C. oestlundii*, which it very much resembles. The fall pupal nymphs are much larger, however, than in the latter form.

Apterous Viviparous Female.—Color, greenish, with a whitish pruinose covering; head and body armed with numerous prominent hairs fan-shaped to rather inverted cone-shaped; size 2.3 to 2.5 mm. long; rostrum reaching beyond second coxa; antennal tubercles moderately prominent; antennae greenish-black with distal ends of IV, V and all of VI black; first antennal gibbous on inner side; III, 0.47 to 0.55 mm. long and armed with 1 to 3 oval sensoria; IV, 0.45 to 0.5 mm.; V, 0.43 to 0.47 mm.; VI, 1.0 to 1.02 (0.13+0.87 to 0.89) mm.; legs moderately long; cornicles 0.31 mm. long, cylindrical and bent outward at an angle a short distance beyond the base; cauda elongate, armed with two long hairs on each side and one on the dorsal surface. The cotypes are in the U.S. National Museum and in the collection of the writer.

Capitophorus xanthii (Oestlund)

Common throughout Utah on underside, and at times, on both sides of leaves of cocklebur (*Xanthium echinatum*). The apterous and alate females were numerous around Tremonton and Bear River City during the fall of 1926.

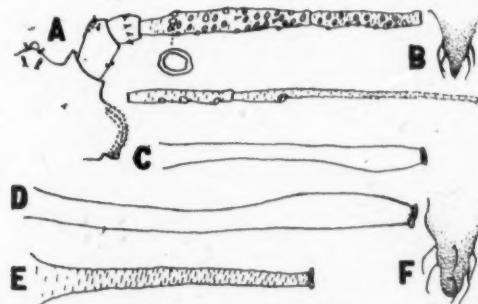


Fig. 3. *Capitophorus xanthii*. A, head and antenna of alate viviparous; B, cauda of alate viviparous; C, cornicle of alate viviparous; D, cornicle of apterous viviparous.

Capitophorus rosarum. E, cornicle of apterous viviparous; F, cauda of apterous viviparous.

Collections also have been taken from Bear River Canyon, Brigham City, Cornish, Dry Lake, Fort Duchesne, Garland, Honeyville, Howell, Johnson, Kanab, Kanesville, Lewiston, Mona, Parowan, Snowville, St. George, Tooele, and Zion National Park Utah. The writer has also collected this form at Clifton and Preston, Idaho.

Capitophorus rosarum (Walker)

Common on roses (*Rosa*) and on *Potentilla*, especially in the cooler canyons. Collected from City Creek Canyon, Cottonwood Canyon, Emigration Canyon, Farmington, Logan Canyon, and Weber Canyon, Utah.

THE LEPIDOPTERA OF THE SETON LAKE REGION, BRITISH COLUMBIA.*

BY J. McDUNNOUGH,
Ottawa, Ont.(Continued from page 214)
GEOMETRIDAE
HEMITHEINAE*Nemoria darwiniata* Dyar. A single ♀, June 15.*Nemoria hudsonaria* Tayl. Quite common during the latter half of June. In a few of the specimens the inner transverse lines are obsolete and these could as well be placed under *unilinearia* Tayl. as under *hudsonaria*. I am not sure at the present time whether the differences given by Taylor are of specific value and until I can study the matter further I use the older of the two names.

SCOPULINAE (ACIDALIINAE)

Scopula (Acidalia) quinquelinearia Pack. Several specimens, May 28-June 15. Also taken at D'Arcy, Anderson Lake.*Ptychopoda rotundopennata* Pack. Two ♂, June 6.*Ptychopoda demissaria* Hbn. The western form of this species, of which I took a small series in early July at light, seems to differ from eastern specimens in the more ruddy coloration, the cross-lines themselves, in the ♂ at least, being reddish; the t. p. line seems also to be more bent below costa of primaries and the median shade is much less obviously smoky. In the male genitalia the dorsal tooth of the clasper is closer to the apex and the uncus is finer and slightly longer. In view of these distinctions I propose the name COLUMBIA for this race with types as follows:—*Holotype*—♂, Seton Lake, July 13 (J. McDunnough); No. 2540 in the Canadian National Collection, Ottawa.*Allotype*—♀, same data.*Paratypes*—Two ♂, July 13, 14; Four ♀ July 8, 12, 13; same locality and collector.After a study of Hubner's figure of *demissaria* in our copy of the Kirby reprint of the "Zutrage" I now feel inclined to use this term for the southern form with *inclusaria* Wlk. as a synonym, leaving *ferrugata* Pack. to apply to the race from the eastern States and Canada.*Cosymbia pendulinaria* Gn. Both Guenee's original description and Walker's description of *quadranulata*, considered as a synonym of this species, state that the species is a pale whitish one with sparse gray sprinkling (d'un blanc pur, finement arrosé de gris). Packard is correct in stating in his Monograph that the larva is a sweet-fern (*Comptonia*) feeder; I have bred four specimens from larvae found on this plant at Sparrow Lake, Ontario and they all belong to this pale form. A ♀ from Seton Lake and a ♂ from Alta Lake, British Columbia show a heavy suffusion of dark gray on the wings, the general appearance being gray, not whitish, and a study of our other western specimens in the collection proves that they all agree with this dark form. Apart from the darker color the two forms seem alike as far as maculation goes, but, as *Comptonia* does not occur in the west, it is evident that the larvae must have a different foodplant. Whether we have here a phytophagous species or merely a color form

is impossible to tell at the present time; in the ♂ genitalia there are only slight differences, the most marked being that the tubercle at the base of the long curved rod-like harpe is smaller in the sweet-fern feeder than in our western form, but this may not be constant. Both forms occur in the east, the spring generation being seemingly much grayer than the summer one, but I have seen no typical *pendulinaria* from the west; for this dark western form I propose the varietal name *GRISEOR* with types as follows:—

Holotype—♂, Alta Lake, Mons, B. C., June 11 (J. McDunnough); No. 2544 in the Canadian National Collection, Ottawa.

Allotype—♀, Seton Lake, Lillooet, B. C., June 6, (J. McDunnough).

Paratypes—Five ♂, Ucluelet, B. C., June 6, (C. H. Young); one ♂, Hope, B. C., June 23, (W. B. Anderson); one ♂, N. Vancouver, B. C., June 26, (Bush); three ♀, Ucluelet, B. C., July 16; one ♀, Agassiz, B. C., June 29, (W. Downes).

LARENTIINAE

Stamnodes sp. One worn ♀ which appears close to *morrisata* Hlst. but is too poor a specimen to identify exactly, especially without the ♂ sex.

LOBOPHORA *montanata* Pack? One ♀, June 8; rather uniformly dark gray on primaries and with less ochreous banding than *magnoliatoidata*; one ♂, D'Arcy, Anderson Lake, June 17 and one ♂, Alta Lake, Mons, June 11 are similar. A careful study of the types of the various names involved in this genus will be necessary before accurate determinations can be made.

Coryphista meadi Pack. One of the commonest geometrids of the district. The form *badiaria* Hy. Edw., in which the antemedian and postmedian areas are pale brown, was also plentiful; this distinction I believe to be only variational, not specific.

Eustroma nubilata Pack. Common in early June.

Lygris propulsata Wlk. Two ♂, June 5, 25.

Lygris atrifasciata Hlst. Five ♂, June 13, 14, 22, 24, July 2.

Lygris xylina Hlst. Common throughout June.

Diactinia silacea Hbn. One ♀; July 1.

Thera georgii Hlst. One ♂, June 30.

Dysstroma truncata Hufn. One ♂, July 8. Very close to the European form *centumnotata* Schulze as figured in Seitz, IV, Pl. 8k.

Dysstroma citrata Linn. Two ♂, June 14, 15. One of these tends towards the form *immanata* Haw. with considerable brown and yellow shading subterminally and terminally.

Dysstroma formosa boreata Tayl. A considerable series of specimens taken in late May and early June seems best referred to this name on account of the upright dark shade which occupies the basal half of the antemedian band, a band that in the allied species is usually bright orange. Taylor's types are in poor condition, as I noted in my paper in the Canadian Entomologist 1912, p. 274, but this dark shade is quite evident; in my Seton Lake series most of the specimens show considerable light brown shading in the outer half of the antemedian band and also in the subterminal area and the same feature is noticeable in a long series in the Canadian National Collection from Keremeos, British Columbia; occasional specimens, however, lack all traces of light brown and these would seem

to approach closest to the types of *boreata*, as far as I remember them. On the other hand in certain specimens we find the brown color has spread until the whole of the median band (normally dark gray) has become light brown, analogous to the variety *mirandata* Tayl. of *hersiliata* Gn. For this striking form I would propose the name **ADMIRANDA**, the types being as follows:

Holotype—♂, Keremeos, B. C., July 1, (C. B. D. Garrett); No. 2538 in the Canadian National Collection, Ottawa.

Allotype—♀, Seton Lake, B. C., June 3, (J. McDunnough).

Paratypes—Two ♂, Keremeos, B. C., June 22, 23, (C. B. D. Garrett).

The species is very close to *hersiliata* in maculation but in general seems to lack the sharp narrow wedge of pale color which projects into the median band beyond the discal dot; this is, however, not entirely constant and there is considerable possibility that *boreata* may prove to be merely the western race of *hersiliata*.

Hydriomena furcata Thun. Four ♂, June 2, 15, 20.

Hydriomena renunciata columbiata B. & McD. Odd specimens, in rather worn condition, came to light all through June and early July; two of these belonged to the form *pernigrata* B. & McD.

Hydriomena ruberata Frey. One worn ♂, June 26.

Xanthorhoe defensaria Gn. A few worn females came to light early in June; the species was evidently already practically over on my arrival.

Xanthorhoe incurvata harveyata S. & C. Three ♂ and two ♀ were captured on Mt. McLean, July 12 which I am assigning to this race. The type lot of specimens, a ♀ of which is before me, were simply labelled "Vancouver, B. C." but it is probable that they were taken by Capt. Harvey on Grouse Mt., which rises to a considerable altitude near Vancouver and which on account of its accessibility, was a favorite collecting ground for the Vancouver entomologists. There are several worn ♀ from this region in the Canadian National Collection ex Bush-Wilson Collection. The species probably occurs at suitable altitudes (4-6000 ft.) all through the Coast and Cascade Ranges; I am unable to separate our specimens satisfactorily from specimens from the main chain of the Rockies to which Swett has given the racial name *lagganata* and to my mind one name would have been sufficient; however, for those who so desire, the name *harveyata* is available for specimens from the above mentioned mountain ranges.

Xanthorhoe fossaria Tayl. This species was not uncommon in the open spruce on Mt. McLean at about 6000 ft. altitude on July 12, but perfect specimens were difficult to obtain. I secured, however, a series of five ♂ and six ♀ showing considerable variability in the depth of coloration of the median dark band of primaries. After a study of a number of genitalic slides from various sections of the Rocky Mountains and British Columbia I have come to the conclusion that *atlinensis* Swett and *blackmorei* Swett, described as good species in the Canadian Entomologist, L. pp. 19, 21, 1918, are merely rather doubtful varieties of *fossaria*; the type of male genitalia is essentially the same in all three forms, the clasper bearing a strong horn on the dorsal margin near apex, preceded by a shorter projection (or at least the rudiments of one) and having its distal end narrow, flat, and covered with small spines. The size of the large horn and its position in relation to the apex of the clasper is decidedly variable, even in

specimens from a single locality; the small horn may also be quite well-developed or reduced to a mere suggestion, but none of these features can be definitely associated with a given race as Mr. Swett would have us believe. A slide from one of the type lot of *fossaria* taken by Bush on Mt. Cheam on August 5, 1903 and retained in his collection (now in the Canadian National Collection), shows a very strongly developed horn and agrees excellently with Swett's characterization; another specimen, however, from the same locality and collection, taken August 12, 1907, has a much shorter horn and the distance between base of horn and apex of clasper is greater; both show a well-developed shorter projection. In a specimen from Laggan, Alberta (also one of the same lot which Taylor had before him from Wolley-Dod when describing *fossaria*) the large horn is somewhat shorter than in Mt. Cheam specimens and the small horn is much reduced; a similar large horn and a better developed short horn was found in specimens from Mt. Revelstoke and Stikeen, British Columbia, these agreeing with Swett's characterization of the genitalia of *atlinensis*. *Blackmorei* from Victoria, British Columbia has, according to Swett, no small horn, but in a slide made from a specimen from the type locality, I find at least a distinct indication of same. In two slides made from my Mt. McLean material there is also variability, one showing a similar reduction of the short horn to that found in *blackmorei* whilst in the other the short horn is well-developed and the large horn is reduced. The other features mentioned by Swett seem to me largely due to the position of the object on the slide. As regards the maculation of the above mentioned specimens I can point to nothing definite (nor could Swett) whereby even racial forms can be separated off. In general it might be said that the low altitude form from the coast (the early date of appearance due to altitude) shows a deeper color in the costal portion of the median band, but some of my McLean specimens are fully as dark and it is probable that, when better and more abundant material is available from Mt. Cheam, similar variability will be noted.

Entephria multivagata Hlst. Common during the first half of June.

Spargania magnoliata pernotata Hlst. Not uncommon during the latter half of June.

Euphyia multifera Wlk. Three specimens, June 2, 15 and 22, all rather worn.

Euphyia luctuata Schiff. Three specimens taken late in June and in early July, one showing partial white banding on the secondaries.

Eulype hastata gothicata Gn. One ♂, July 3; not quite typical of this form as the secondaries show a narrow white band.

Perizoma curvilinea Hlst. One ♀, July 6.

Perizoma costiguttata Hlst. Common from the end of May until the middle of June.

Ceratodalia guencata Pack. Common in June.

Horisme intestinata Gn. Three ♀, June 5, 6 and July 6.

Horisme incana var. *columbia* var. nov.

The form from Alberta has been given the name *incana* by Swett (Psyche, XXIV, 190, 1917) and judging by a comparison of the ♂ genitalia of *incana* with Pierce's figure of those of the European *vitalbata* the former may be considered a good species. At Seton Lake on June 24 I took a very perfect ♂ specimen which

besides being considerably larger than Alberta specimens lacks the brown shading in the median and subterminal areas, this being replaced by dark gray. I propose the above varietal name for this British Columbia race, the holotype being the specimen above mentioned, No. 2545 in the Canadian National Collection, Ottawa. I have further a worn ♂ from the same locality (May 30) and a still poorer ♀ from Kaslo, British Columbia (August 6) which I am not making types on account of their rubbed condition.

Eupithecia misturata Hlst. (*insignifata* Tayl., *sublineata* Tayl., *scelestata* Tayl.) This was the commonest species at Seton Lake and was on the wing during the entire month of June; in order to arrive at the above synonymy it was necessary to make a great number of genitalic slides, both of ♂ and ♀, comprising specimens from the following localities:—One ♂, Shasta Retreat, N. Calif. (topotypical for *misturata*), two ♂, one ♀, Oakland, Calif., three ♂, Kaslo, B. C. including ♂ paratype of *scelestata* from Cockle collection; three ♂, two ♀, from Vancouver Island, B. C., one ♀, determined by Taylor as *sublineata*, the others topotypical of *insignifata* and five ♂, two ♀ from Seton Lake, B. C. I can find no feature in either ♂ or ♀ genitalia which would lead me to suspect that more than one species was involved; the main feature in the ♂ genitalia is the presence of a small spine about the middle of the ventral margin of the claspers, the aedeagus shows a small bent chitinous plate at the lower end and a long, weakly chitinized rod, somewhat curved apically, occupying a large section of this organ; the ventral plate of the last abdominal segment is very weakly chitinized and consists of a narrow rod, arising from a triangular base. At first I thought I had discovered differences in the shape of the labides, but further slides led me to the conclusion that these may become easily bent at the base and thus distorted from their normal position which is, as usual, petal-like, curving outward apically and ending in a point. In the ♀ the bursa is rather rectangular and only armed with a few weak spines on an area situated below the entrance of the ductus bursae.

There are apparently two generations of the species, Taylor's type material and most of our Vancouver Island specimens having been captured in March and April; Kaslo specimens before me show both April and July dates.

Eupithecia coagulata Gn. One ♀, June 29. Agrees in genitalia with eastern specimens of this species.

Eupithecia alberta Tayl. (*slocanata* Tayl.). Two ♂, five ♀, June 21, 25, 28, July 2, 13. I have made slides of the genitalia of two ♂ and two ♀, also of a ♀ from Kaslo, B. C., which agrees with a ♀ paratype of *slocanata* (with missing abdomen) in the Canadian National Collection. I can see no difference between these slides and those made from topotypical material of *alberta* Tayl. including a specimen of the type lot from the Dod collection and imagine therefore that *slocanata* merely represents a slightly grayer, more suffused form of *alberta* which is probably not even constant, judging by the Kaslo series before me.

Eupithecia perfusca Hlst. One ♀, June 3.

Eupithecia cretacea Pack. One ♂, four ♀ in early July; with the exception of one ♀, these all belong to the very large form which appears predominant in central British Columbia.

Eupithecia borealis Hst. Two ♂, June 26, 28.

Eupithecia dyarata Tayl. Three ♂, four ♀, June 3, 7, 14, 15, 21, 25, 26.
Eupithecia perbrunneata Tayl. One ♂, May 30.

Eupithecia tenuata Hst. Two ♂, two ♀, June 15, 29, July 2, 5.

Eupithecia togata Hbn. One ♂, four ♀, June 12, 15, 30, July 2, 6. My specimens agree very closely in both ♂ and ♀ genitalia with Petersen's figures of these organs in European specimens (1909, Iris, Pl. V, fig. 20) and I am therefore using *togata* Hbn. in preference to *spermaphaga* Dyar which would appear to be a synonym.

GEOMETRINAE

Drepanularix rectifascia Hst. Common in late May and early June. The adults could generally be disturbed in dull weather from bushes of *Lepargyraca*, which is probably the food plant of the larvae. Fresh specimens, especially ♀, show a strong pinkish tinge in the terminal area of both wings.

Drepanulatrix lutearia B. & McD. One ♀, June 3.

Drepanulatrix secundaria B. & McD. One ♀, June 21.

Drepanulatrix unicalcararia Gn. Four ♀; May 30, June 5, 7, 20.

Macaria adonis B. & McD. Four specimens, all rather worn, taken on various dates in the first half of June.

Macaria granitata Gn. Early in June I took four ♀ and a single worn ♂ which seem best referred for the present to the variety *dis puncta* Wlk. the oldest of Walker's names in this group and one based on Canadian material. *Exnotata* Wlk. and *retinotata* Wlk. may merely be based on the ♀ of the same race but without more and better eastern material before me I cannot attempt at the present time to revise the group.

Along with the above mentioned specimens I took others of a form which is evidently closely allied but which has always puzzled me to place. As odd specimens of this form crop up from time to time from various mountain localities, and as there seems no name available I am describing it as a new species; eventually it may prove to be a mere melanic form of *granitata* but this cannot be definitely ascertained until the species has been bred; there seem to be slight differences in both ♂ and ♀ genitalia between the two forms, but I have not sufficient material available to decide whether these differences are constant or not.

Macaria perplexa sp. n.

♂—Differs from *granitata dis puncta* in its larger size, more oblique outer margin of primaries and the almost unicolorous deep gray-brown color of both wings. Thorax and abdomen gray-brown, latter banded with darker black-brown on posterior portion of segments. Primaries almost unicolorous deep gray-brown with a faint purplish tinge, crossed by three irregular black-brown lines; the t. a. line angles outwardly below costa and is then upright and slightly waved to inner margin; median line rather obscure, upright, arising from a small dark blotch on costa and passing through an obscure discal dot; t. p. line thickest at costa as an oblique dash, then in general upright and irregularly waved to inner margin; beyond the t. p. line there is at times traces of a dark spot in the interspace between veins three and four but the costal spot is either totally lacking or reduced to a mere slight dark dash along costal margin. Sub-

apically there is some slight whitish shading which tends to continue towards tornus as an obsolescent s. t. line; a terminal broken black line; fringes light smoky, checkered with darker. Secondaries only slightly paler than primaries, faintly peppered with minute whitish dots, inner margin whitish; a small dark discal dot, a broken terminal dark line and two dark spots on inner margin above tornus; fringes as on primaries. Beneath purplish-brown, peppered with white, more so on secondaries than on primaries; costal margin of primaries and most of the secondaries with a slight ochreous tinge; slight white subapical shading on primaries; a small dark discal dot on all wings; fringes as above.

♀.—Primaries considerably lighter than in ♂, due to a heavy sprinkling of white scaling especially in basal two-thirds of wing; cross-lines heavier and blacker with traces of the dark subterminal shade beyond t. p. line, especially at costa. Secondaries also more heavily sprinkled with white; beneath much as in ♂. Expanse 30-32 mm.

Holotype—♂, Nicola, B. C., May 24, (P. N. Vroom), No. 2546 in the Canadian National Collection, Ottawa.

Allotype—♀, Seton Lake, B. C., June 6 (J. McDunnough).

Paratypes—One ♂, Keremeos, B. C., June 23, (C. B. Garrett); one ♂, Banff, Alta., June 14, (C. B. Garrett); one ♂, Field, B. C., July 8, (F. H. Wolley-Dod); two ♀, Seton Lake, B. C., July 8, (J. McDunnough); one ♀, Keremeos, B. C., July 1, (C. B. Garrett).

I have several other worn specimens before me which I do not include in the type series as they are liable to give an erroneous impression of the maculation.

Macaria denticulata Grt. Common throughout June and early July.

Phasiane respersata Hlst. Two ♂ specimens of what seems to be the typical form of this species were taken June 15 and 25.

Phasiane neptaria sinuata Pack. Two ♂ and three ♀ (June 6, 15 and July 1 and 2) of this large form were taken. One ♂ (June 29) was much smaller and nearer typical *neptaria* in maculation.

Phasiane curvata Grt. Three ♂ and one ♀ were captured June 29, July 4, 8, and 14. One ♀ was bred from a pale green larva found feeding on rabbit brush (*Chrysothamnus*) and emerged July 1. The species seems widespread throughout the dry belt of British Columbia and the series before me is slightly paler and less heavily marked than Arizona and New Mexico specimens but I can see otherwise no tangible differences. The food-plant would indicate that *curvata* is a distinct species from the eastern *orillata*; the fact that the t. a. line is heavy in its inner half and more or less obsolescent in costal half in *curvata* also points in this direction.

Phasiane setonana n. sp.

♂—Primaries light brown, somewhat irrorate with white striae and crossed by heavy blackish t. a. and t. p. lines. T. a. line slightly angled on cubital vein and from this point gently inwardly oblique to inner margin. T. p. perpendicular to inner margin to base of vein two, then strongly outwardly oblique to base of vein five or to a point opposite discal streak, then parallel again to its former course to costa; slight dark shading preceding t. a. line and following t. p. line above inner margin and a dark shade below costa near apex

of wing; discal streak prominent but median shade only faintly indicated; a broken terminal dark line, fringes smoky, slightly checkered and with a pale basal line. Secondaries rather paler than primaries with faint discal dot and small dark dash on anal margin beyond middle. Beneath pale smoky gray with the dark markings of upper side showing faintly through.

♀—Slightly more striate with white than the ♂ but identical in maculation. Expanse 28-30 mm.

Holotype—♂, Seton Lake, B. C., June 7, (J. McDunnough); No. 2547 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality June 3.

Paratypes—One ♂, one ♀, same locality June 3, 6.

The species is closest to *excavata* Pack. but differs in the strongly bent nature of the t. p. line. I can find no name available for the species which is larger and obviously distinct from *curvata* Grt.; *tulareata* C. & S. seems close but I do not know the species and cannot make the description fit my specimens very well. My types are slightly worn and fresher specimens may show more white striations; I have a single ♂ before me from Nicola, British Columbia which seems to belong here by maculation but is heavily striate with white and shows heavier dark shades beyond the t. p. line.

Hesperumia sulphuraria ochreata Pack. Common in the latter half of June; both the forms *baltearia* and *unicoloraria* were represented in the series.

Itame sulphurea Pack. One ♂, June 14.

Itame quadrilinearia Pack. One ♂, July 8; also one ♂ at D'Arcy, Anderson Lake, on June 17.

Itame exauspicata Wlk. One ♂, July 14.

Itame plumosata B. & McD. Extremely common in late June and early July.

Itame denticulodes Hlst. A few specimens of both sexes, in late June and early July, rather smaller than Alberta ones but otherwise not noticeably different.

Itame matilda Dyar. Three ♂, May 30, June 3; also one ♂ ♀ at D'Arcy, Anderson Lake, June 17.

Elpiste lorquinaria Gn. One ♀ July 6.

Sericosema juturnaria Gn. Common throughout June.

(To be Continued)

SOME AMERICAN HIPPOBOSCIDAE (DIPTERA PUPIPARA).

BY G. F. FERRIS,

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The material here dealt with has all been obtained by various individuals in the course of bird-banding operations. The habits of these flies are such that their collection is rendered somewhat difficult, for they leave their hosts the instant that the latter appear to be in difficulty and their flight is extremely quick and erratic. Nevertheless, it appears that bird-banding can be made to yield an interesting by-product in the form of increased knowledge of these parasites:

For the material here considered I am especially indebted to an Ornithologist, Mr. J. E. Law, who has engaged extensively in bird-banding. Other material has been received from time to time from various students who have sporadically engaged in the same pursuit.

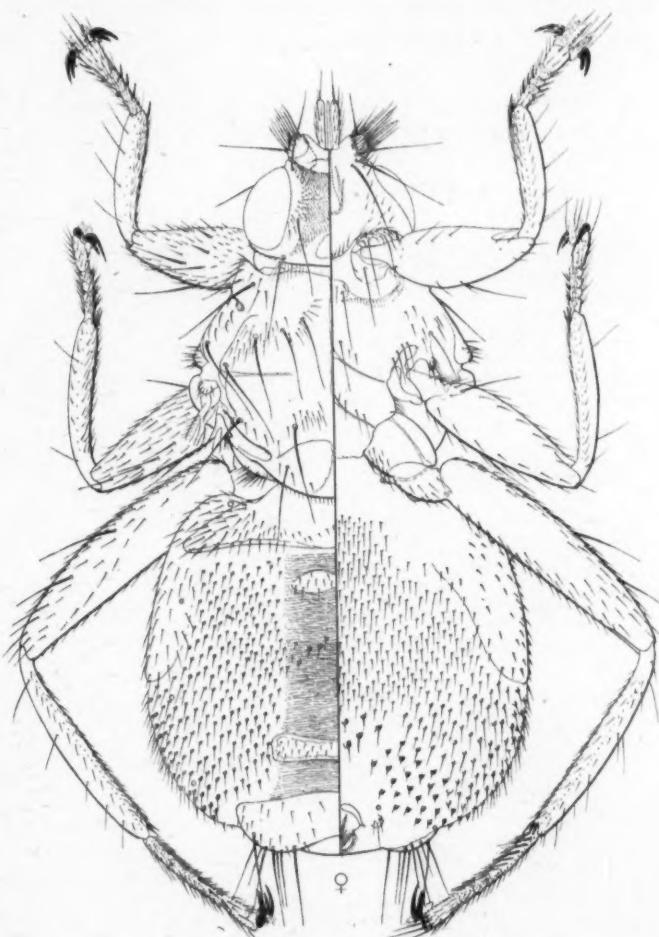


Fig. 1. *Lynchia americana* (Leach); female, wings removed. From specimen from *Otus asio* in California.

Genus **Lynchia** Weyenbergh.

Approximately ten species have been described from North America as belonging to this genus (*Olfersia* of authors, *Ornithoponus* Aldrich). Of these it is improbable that any with the exception of *L. americana* (Leach) can be positively identified on the basis of the existing literature unless taken from their typical host and locality. The descriptions deal with little but color, which is undoubtedly somewhat variable, and with the more obvious features of wing ven-

ation and the like, and nothing at all is said in most cases of those structural peculiarities which the examination of a considerable series of species indicates as the most definite basis for specific differentiation.

I am here following Bequaert in transferring the generic name *Lynchia* to the group which has of recent years commonly been called *Olfersia*.

***Lynchia americana* (Leach).**

Figs. 1, 2.

1922 *Olfersia americana* (Leach), Ferris & Cole, Parasitology 14: 194-196; tf. 11, 12.

This species appears to be constantly associated with owls. The following record is in addition to those given by Ferris and Cole. From *Otus asio*, Monticito, Calif., Sept. 11, 1924 (J. E. Law).

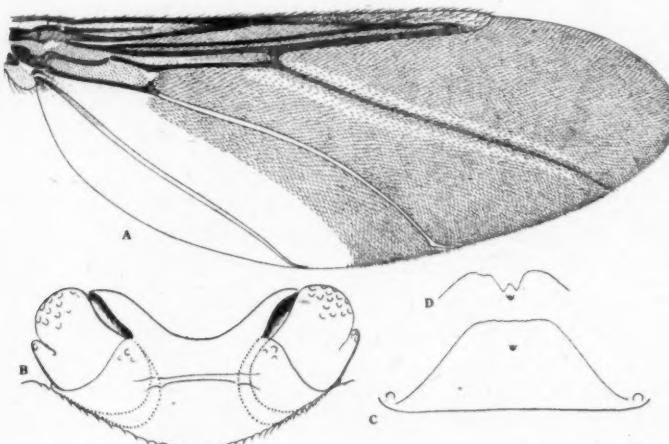


Fig. 2. *Lynchia americana* (Leach); A—wing; B—clypeal region; C—ocellar triangle; D—variation of ocellar triangle.

The identification of this species may be accepted as positive since it is based upon specimens which were compared by Austen with the types in the British Museum. The species is one of our most common forms and is also of considerable nomenclatorial importance, since it was once regarded as the type of *Olfersia* and has also been used as the type of *Ornithoponus*. I am therefore presenting additional figures which are somewhat better than those accompanying the paper above cited.

The sexual differences are insignificant, the male differing from the female in the presence of the internal copulatory apparatus and the presence of the usual pair of external processes, these latter very small and short.

I would here call attention to the pattern of the setulae on the wing (Fig. 2A), which appears to be specifically significant in the members of this genus. It should be noted also that the subcosta is interrupted and does not attain the costa. The clypeal region (Fig. 2B) is distinctly emarginate, but the lateral processes do not exceed the antennae. The ocellar triangle (Fig. 2C) is not incised anteriorly, although in some specimens there is a slight tendency toward a

median emargination (Fig. 2D), but it bears in all the specimens examined a small, pore-like depression which marks the terminus of a median incision in certain foreign species.

The pleurotergite of the postscutellum is not at all swollen; it bears a cluster of numerous setae which are concealed above the posterior coxa.

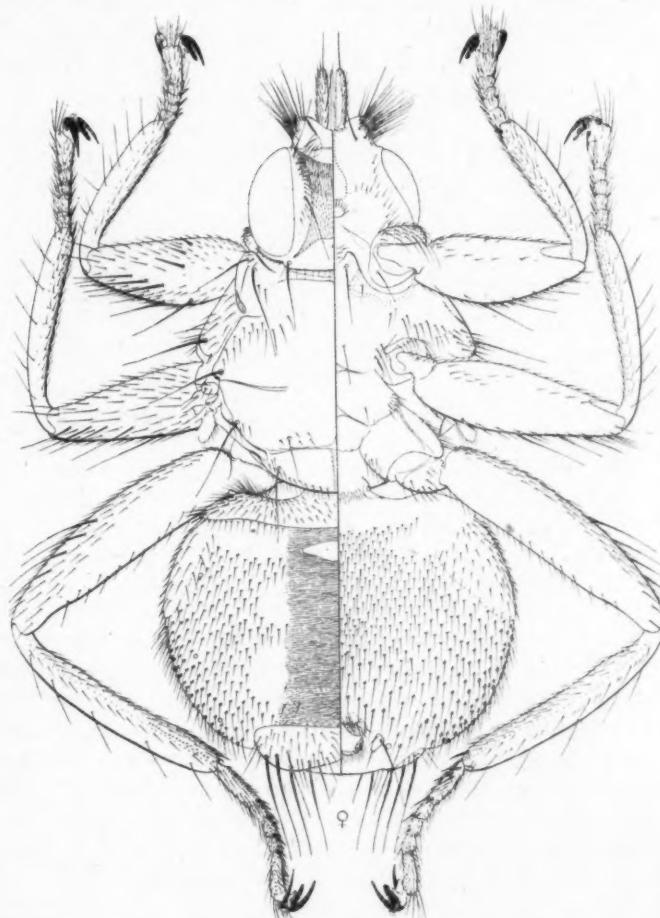


Fig. 3. *Lynchia hirsuta* n. sp.; female, wings removed. From holotype.

The abdomen bears but a single small tergal plate in addition to the usual basal and apical plates. The median dorsal area of transverse striations, which is common to all the species of the Olfersiine type, is well defined. The spiracles are extremely small.

***Lynchia hirsuta* n. sp.**

Figs. 3, 4.

Material examined. The holotype, a female, from quail, *Lophortyx californianus*, Stanford University, Calif., Dec. 14, 1923 (C. D. Duncan and E.

Quayle), the allotype from the same host and locality, Oct. 21, 1925 (L. E. Myers), and a paratype male from brown thrasher, *Toxostoma redivivum redivivum*, Altadena, Calif., Sept. 20, 1924 (J. E. Law).

Female (Fig. 3). Length on slide 5 mm., length of wing 5 mm. Clypeus (Fig. 4C) emarginate, the lateral processes very slightly exceeding the antennae. Ocellar triangle rather faintly defined, without median incision or emargination and with a small, median area of heavier chitinization. Orbita broad, with two large and numerous fine setae. Ventral side of the head with three conspicuously long setae near the base of antenna.

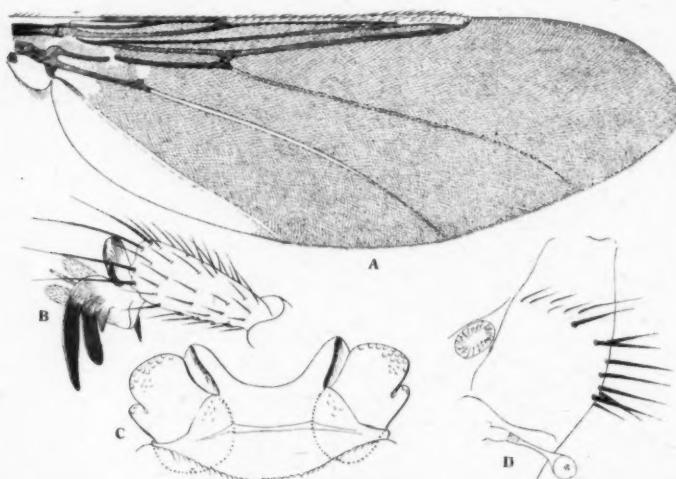


Fig. 4. *Lynchia hirsuta* n. sp.: A—wing; B—last segment of tarsus; C—clypeal region; D—pleurotergite of post-scutellum as seen from ventral aspect with posterior coxa removed.

Thorax with the humeral calli very short and broad, but acutely pointed. In addition to the fixed setae, which are to be found in all the species of the genus, there are three long setae on each half of the prescutum and a pair of long prescutellars. Scutellum with a distinct median sulcus, which divides it into two lobes. Pleurotergite of the post-scutellum distinctly swollen (Fig. 4D) and bearing a cluster of setae which are concealed above the posterior coxa. Sternum with an undivided lobe between the anterior coxae.

Legs with no specially distinctive characters, but rather noticeably sparsely haired. Wings (Fig. 4A) entirely beset with setulae except for the area behind the anal vein. Subcosta complete, attaining the costa.

Abdomen with two small tergal plates in addition to the usual basal and apical plates. The anterior lateral region shows a weakly defined plate on each side, this sparsely beset with setae, and the median dorsal area of transverse striations is almost devoid of setae. The membranous areas are beset with small slender setae which are borne upon slight tubercles and in the apical region on the ventral side there are numerous small, stout setae of which the supporting tubercles are noticeably larger.

Male closely resembling the female but slightly smaller, length 4.5 mm., length of wing 4.5 mm. The external genitalia are represented merely by a pair of small flaps.

Notes.—The salient characters of the species are as noted above. A comparison of the figures with those of *L. americana* will indicate other minor differences as well. No other American species of the genus are available for comparison.

Genus *Ornithoica* Rondani.

Ornithoica promiscua Ferris and Cole.

1922. *Ornithoica promiscua* Ferris and Cole, Parasitology 14: 203-205; tf. 19, 20.
1923. *Ornithoica confluenta* (Say), Aldrich, Insector Inscitiae Menstruus 11: 79. (Part).
1924. *Ornithoica promiscua* Ferris and Cole, Ferris, Ent. News 35: 235.
1925. *Ornithoica promiscua* Ferris and Cole, Ferris, Philippine Journ. Science 28: 331-332; tf. 1, 2.
1926. *Ornithoica promiscua* Ferris and Cole, Ferris in Essig, Insects Western North America, p. 621, fig. 501.

In addition to the previously published records of this species I have the following: *Junco thurberi*, Bluff Lake, San Bernardino Mts., Calif. Aug. 23, 1924 (J. E. Law); *Zonotrichia coronata*, Altadena, Calif., Oct. 4, 1924 (J. E. Law) and Stanford University, Calif., Oct. 21, 1925, Dec. 24, 1923 and Jan. 1, 1924; *Pipilo maculatus* ssp., Altadena, Calif., Sept. 19, 1924 (J. E. Law); English sparrow, California jay and spurred towhee, Pasadena, Calif., Oct. 12, 1924 (H. Michener).

I have recorded the species also from numerous hosts in the Philippine Islands and, in a paper now in press, from Samoa. The Samoan and Philippine specimens differ from the California specimens in the somewhat larger size of the tubercles on the ventral side of the abdomen, but a comparison of the rather long series of specimens now available to me does not indicate that the difference is either sufficiently great or sufficiently sharply defined to make any specific distinctions desirable.

Genus *Ornithomyia* Latreille.

I have elsewhere indicated as one of the characters which might be utilized for the separation of this genus and *Ornithoictona* the absence of a transverse comb of setae on the first segment of the posterior tarsus in the former. An examination of further material shows that this does not hold. The comb is present in at least some species of *Ornithomyia*, although it certainly is not as strongly developed as in the species of *Ornithoictona* which are available.

Ornithomyia avicularia (Linnaeus).

1922. *Ornithomyia avicularia* (L.), Ferris and Cole, Parasitology 14: 199-200; tf. 15, 16.

In addition to the specimens recorded in the paper cited above there are available the following: from *Myadestes townsendi*, Baldwin Lake, San Bernardino Mts., Calif., Sept. 27, 1924 (J. E. Law); *Glaucidium gnoma californica*, La Honda, San Mateo Co., Calif., Oct. 15, 1923; tanager and starling, Vancouver, Canada, these latter received through the kindness of some correspondent who did not include his name with the material. I have at hand also specimens from the Philippine Islands which agree closely with all of these.

The determination of this as the European *O. avicularia* is by no means positive.

ANNUAL MEETING ENTOMOLOGICAL SOCIETY
OF ONTARIO

The Sixty-fourth Annual Meeting of the Entomological Society of Ontario will be held in Ottawa on Thursday and Friday, November 17th and 18th, 1927.

A special effort is being made to have all members and friends of the Society present at the meetings, including many friends and co-workers from the United States.

Hotel Reservations may be obtained at:

		Single Room without bath	Single Room with bath	Double Room without bath	Double Room with bath
Chateau Laurier	E	\$3.50-4.00	\$5.00 up	\$6.00 up	\$7.00 up
Alexandra	A	\$4.50	\$5.00	\$8.50	\$9.00
Windsor	A	\$3.50	\$4.50	\$7.00	\$9.00
Y. M. C. A.	E		\$1.25		\$1.75

(non-members)

E. indicates European plan.

A. indicates American plan

The Entomological Branch, Birks Building, Sparks Street, Ottawa, will be headquarters for the meetings.

REV. FATHER LEOPOLD
President.

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-O. A. C., Guelph.

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